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SEMESTER END EXAMINATION APRIL-MAY, 2026

Course Name:- B.Tech **Semester:- II**

Paper Name:- Engineering Physics **Paper Code:- NBS 201**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions. Each question carries **10 marks.**

Section – A
Objective Questions

1. Answer all the following questions. 5x3 =15

i) The Compton effect proves the _____ nature of light
   a. Wave
   b. Particle
   c. Dual
   d. Magnetic

ii) Skin depth decreases with an increase in
   a. Frequency
   b. Resistance
   c. Length
   d. Area

iii) Grating dispersive power depends on
   a. Wavelength
   b. Number of lines
   c. Angle
   d. All

iv) Multimode graded index fibers with wavelength of 0.85μm have numerical aperture of 0.29 have core/cladding diameter of _____
   a. 62.5 μm/125 μm
   b. 100 μm/140 μm
   c. 85 μm/125 μm
   d. 50 μm/125μm

v) Persistent current flows
   a. Temporarily
   b. Without decay
   c. With resistance
   d. Randomly

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Section - B
Short Answer Questions

2. Answer any five of the following questions. 5x7=35

i) Explain de-Broglie hypothesis. And, derive energy and wavelength relationship.

ii) Explain displacement current concept. And, derive continuity equation for current density.

iii) State and explain Rayleigh's criterion of resolution with proper diagram.

iv) Explain principle of optical fiber. And, derive expression for numerical aperture.

v) Explain He-Ne laser construction and working with proper ray diagram.

vi) Define critical temperature, critical field and Meissner effect in superconductor.

vii) Discuss synthesis of nanomaterials using AP-CVD and RP-CVD method with proper diagram.

Section - C
Descriptive Questions

3. Answer any two of the following question. 2x10=20

i) Define Wave function and Solve Schrödinger wave equation for a particle in a 1D box, with proper diagram.

ii) Derive relation between electric and magnetic fields in EM wave, step by step.

iii) Explain Newton's rings with derivation and applications with proper ray diagram.

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Umar Naseem

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